LICK TELESCOPE.

A Visit to the Great Observatory on Mount Hamilton.

James Lick and His Gift to Science-Looking Shrough the Largest Telescope in the World-A View of Castor and Pollux-The Red Planet and Its Increasing Canals-Saturn, the Ringed Planet-Our Satellite,

BY CAPT. TOM G. CLARK, ALMA, CAL, [COPYRIOUT, 1821.]



LTHOUGH the readers of THE NATIONAL THERENE have heard much of the Lick telescope, and the incoleulable aid to science that it has proved itself, I suppose little is really known either of how it was invented and constructed, or of the career of the philantropist who devoted so

much of his life to one of the grandest projects accomplished in the domain of astronomy. James Lick was one of the Argonauts, and none of these pioneers had a more romantic and varied life.

He was born in Fredericksburg, Pa., Aug. 25, 1796. Owing to his generatric and reserved mature little was known of his history until life are still obscure, but the first significant | coach drawn by four stout bays, event in his career was disappointment in

important as the one he himself possessed. one thousand times as much as his hithertofore he died be built a large flouring will near San Jose, Cal., putting in the finest machinery to be obtained and finishing all the wood-work in mahogany. Its value as a structure was more than \$500,000.

It was in the year 1821 that

JAMES LICK BID GOOD-BY to his native land and emigrated to South America, where at Rio Janeiro he worked at his trade of cabinet-making for a period of 10 years. Thence he went to Valparaiso, and engaged in pinno-making. In the first mouth of 1847 he sailed for California, taking with him a fortune of \$50,000, amassed in the Southern Continent. He immediately put this to prac-



tical use by investments in San Francisco real

further building up that fortune, which reached the sum of \$20,000,000 before his death. And now his philanthropic work began. In 1874 he assigned \$2,000,000 of his possessions to tractees for various public and private purpoles. In 1875 a revised deed was made. Besides large sums to be given to various charities, he directed that \$150,000 be paid for the establishment and maintenance of free palhe baths in San Francisco; \$100,000 for statumry for the new City Hall in the same city; \$60,000 for a monument to Francis Scott Key. author of the "Star Spangled Banner; " \$540,000

to found and endow the California School of

Mechanic Arts in San Francisco, and \$700,000

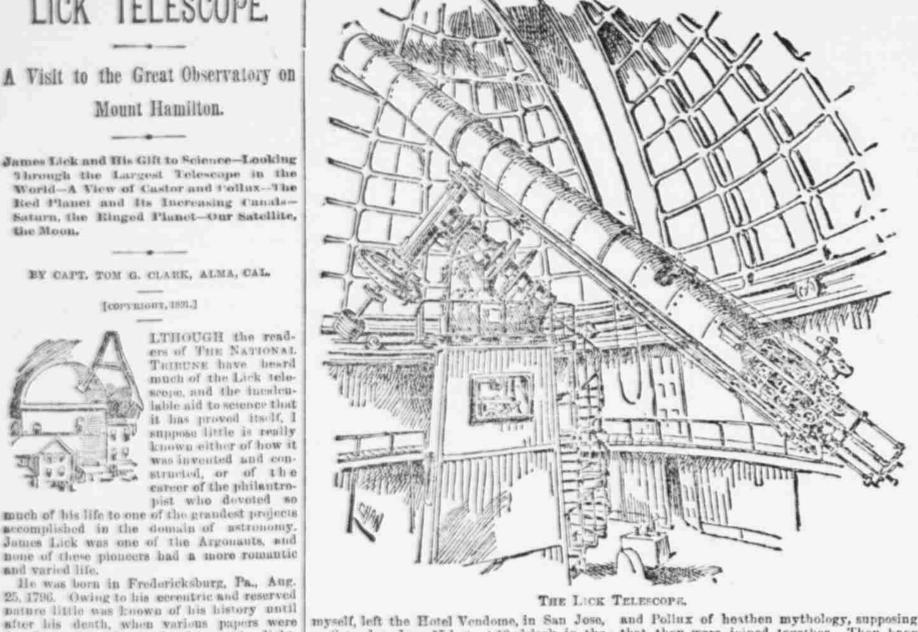
estate and a few industries on the Pacific coast,

for procuring for the University of California a telescope of greater power than any yet made. His idea in regard to the telescope came about in this way: It was his habit to leave his bed at night on account of insomnia, and to wander about outdoors. Naturally of a thinking mind, be at length became greatly interested in studying the heavens. This spirit was stimulated by his companion in many a midnight stroll, an an old learned Spanish priest. At last, a desire that science might be aided more strongly than hitherto in its researches into the mysteries of the heavens took shape in his offering

the vast sum for the furtherance of his project. Notwithstanding his reserved and unobtrusive disposition, James Lick had many friends, and it is said that to him were indebted the millionaires Leland Stanford and "Lucky" Baldwin for a good start in life. On Oct. 1, 1876, James Lick died. It was his

NO PUNERAL SERVICE

should be said, or tears shed over his remains, and that no marble shaft should mark his resting place. He only asked that, and when the Observatory which now bears his name should be completed, and in readiness for the telescope, his remains might be brought to Monut Hamil-



found that brought much of it to the light. on Saturday, June 15 last, at 10 o'clock in the that they were joined together. They have Comparatively, the incidents of his very early morning. Our conveyance was a Concord the appearance through the glass of two very The road up the mount in is a marvel of miles apart. They are beyond a doubt suns

intentions to marry the daughter of a rich | County, and its rost was over \$100,000. The road- | planets and stars. miller, who would not give him the young wo- | way is wide enough for two coaches to pass on | man because of his poverty, and who further, the gallop without danger. The way has been astronomers supposed that all stars, excepting in his refusal, added insult to injury by de- so carefully constructed that it is perfectly safe our own planetary system, were stationary, and claring that no man could marry his daughter | even along the most precipitous parts of the | for that reason they were called fixed stars. who could not own a flour mill as large and | mountain, and so graded that there are no places | The great astronomer Herschel claimed that too steep for the easy hauling of loaded coaches. Young Lick, in the presence of his betrothed | The ascent is a pleasure drive rather than and her stern father, vowed before heaven that a journey, and is made by almost every tourhe would yet own a mill that should be worth | ist to the Pacific coast. The Mount Hamilton road is 24 miles in length and is connected prospective father-in-law owned; a vow which | with the Alum Rock avenue, which is four he strangely enough kept, for a few years be- miles long, thus making a total distance of 28 miles from San Jose to the summit of the For the first seven miles after leaving the

Alum Rock avenue the Mount Hamilton road winds through the green foothills of the Santa Clara Valley. In the midst of these hills are vineyards, orchards, and tasteful homes. After traversing the crest of the ridge at an elevation of about 2,600 feet, the road passes to the eastern side. Here in a few moments the aspect of the landscape changes utterly. Now we are impressed by the grandeur, solitude and desolation of the mountains; deep gorges on one side and tall cliffs on the other. The read soon takes a downward course until there is reached what is known as

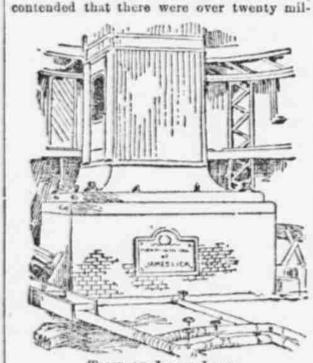
HALL'S VALLEY, a great basin in the mountain. On the way to this basin one passes many rolling hills, dotted with buge oaks and ravines filled with madrone, manzanita and wild laurel. In the season of the year in which we made the ascent the gorges and sides of the mountain are cov-

ered with the exquisite wild flowers for which

California is noted. From Hall's Valley the roadway crosses a low | lion of these star suns, around which billions range of hills and then descends into a small of star planets revolve. It is natural for us in valley, through which runs a mountain stream | looking at these star suns to ask ourselves called Smith's Creek. Here a fine hotel stands, where are the frontiers of this boundles embowered in trees and flowers. The first beaven, where the last remote spot beyond stop is made for supper. At this point the which no star glitters on the dark bosom of mountain rises in a sheer wall 2,000 feet eternal night? bigh. And here again the magnificent work

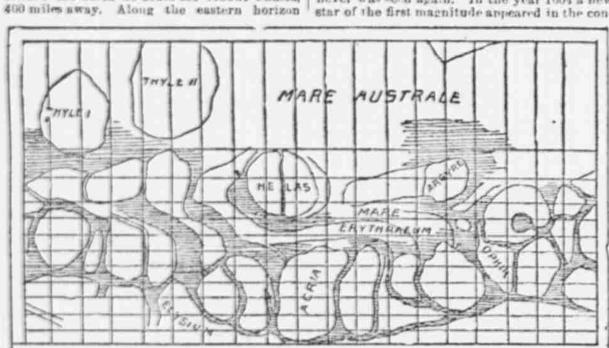
bright electric lights, but they are millions of love, or at least in the accomplishment of his fine engineering. It was built by Santa Clara of great power, around which circle lesser

Prof. Holden told me that the early Greek they did move, but so very slowly that it would take the combined ages of 10 generations of people to mark the revolution of one of these star planets around its sun. Proctor, the learned American astronomer,



TOMB OF JAMES LICK.

There are some instances of star suns which done in the making of the road becomes ap- have suddenly appeared and shone for a time parent. To overcome the difficulty of this with great brilliancy, and disappeared shortly ascent the road is made to curve 364 times in afterwards. In the year 1572 such a star apthe short distance of seven miles before the peared in the constellation of Cassiopseia, and was described by the astronomer Tycho Brabe. Our little party arrived in safety at the top It outshone Jupiter and Venus, and could be just in time to catch a glimpse of the most | seen at noon. It underwent several changes of magnificent souset I ever beheld. Looking | color. After six months it disappeared and toward the north we could see Mount Shasta, | never was seen again. In the year 1004 a new



MAP OF MARS.

stretched the Sierra Nevada range, to the west | stellation of Ophinchus. It was visible for the Santa Cruz mountains, with mighty red- over one year and then disappeared. This is wood forests, towered, and to the south the something called Santa Clara Valley lay below us, green with its extensive orchards and vineyards and nestling in peaceful beauty beneath our feet.

We now turned and entered the main building of the Observatory. It is constructed of double brick walls, and occupies a space of 200 feet one way and 40 feet the other. Other buildings surround it, all built of brick or stone, for the accommodation of the astronomers. The inside woodwork of the buildings is of redwood finished in superb style.

TWO TELESCOPES in the main building. The smaller, in the ton, and reinterred under the base of the enor- west dome, 14 feet in length and weighing six mous machine which was to enlighten science, | tons, is used in taking photographs of the fixed solve the secrets of the heavens, and give him | stars. In the east dome is the great Lick in-It was on Jan. 9, 1887, the anniversary of the ers, five years was the time taken to complete | telescope they could be plainly seen going at a

belonging to the Observatory, offered to show us

all that might be seen of interest on that night.

THE FIRST SPECTACLE



THE OBSERVATORY.

min 40 years before, that a mighty funeral cor- | dead weight of 24 tons, and is 56; feet in tege might have been seen winding up the length, wine-clad slope of the beautiful Santa Clara | The immense burnished steel dome, which Valley toward the top of Mount Hamilton, can be seen 100 miles out at sea, weighs 135 where the American flag was flying at half | tons, but it is made to revolve by bydraulie must and the great Observatory building draped | power so easily that a child could move it into in mourning. At the top of the monutain any required position. Extending from its there was gathered a vast concourse of people, circumference to the top is an opening 10 feet from every portion of the United States, among | wide. By means of this opening and the mothem the most noted scientists, explorers and | tion of the dome the telescope, though solidly philosophers, to pay the last tribute of respect fixed at the base, may be moved in any reto the philanthropist's memory. Prof. Holden, quired direction above the horizon. The openof the Observatory, delivered an eloquent ing in the dome is provided with a covering of eulogy on the purposes and character of the steel plates which operate like folding doors, the deceased, showing that the world had always object being to protect the adjustments and misjudged him, and that under an eccentric furniture from storms, outward bearing beat a heart full of generous | We were very kindly received by Prof. Holand high impulses. So James Lick's remains | den, and he himself, with two other gentlemen

now lie under the base of the MONSTER TELESCOPE.

And now I purpose to say something about this telescope, its surroundings, and the men be turned to was the constellation of the who have charge of it, as well as tell Gemini, and he hade us look at Castor and of the things I saw through its powerful Pollux. Pollux is a star of the first magnitude,

REPLER'S STAR, because this astronomer observed and recorded its changes and appearance.

Prof. Holden and his two assistants now dropped the platform 10 feet and adjusted the glass, so that we were looking at Saturn, the ringed planet. Saturn itself is an immenso body of land and water; I judge, by the color of her seas, which are green like ours, | nels, about four-fifths water and one-fifth land. The land has a darker appearance, and its features are not distinctly defined. We can see four of her moons plainly, the other four being on the opposite side of the planet. But the most interesting study of all is her mysterious rings, They look like a million small, very bright electric lights, placed close together, and construment. Alvin Clark & Sons were the build- | tinually in motion. Looking through the great day when James Lick first set foot in Califor- it, and its cost was about \$590,000. It has a great rate of speed. Prof. Holden says they are small moons about one hundred miles apart, held in their place by the power of attraction of Saturn and her eight moons.

Learned astromoners, Herschel among the number, contended that Saturn was the world producer or mother planet of our planetary system, and that these rings are composed of chula thrown off in rings from Saturn. He thought that in the course of time this nebula would form itself into small planets, and in the course of millions of years, when they came to from mother Saturn and would go sailing away into space, covered with vegetation, seas, mighty rivers, and inhabited by a strange race of

As Saturn is 291 years in making a complete period to show all the different phases of its Then they disappear, except in the most powerful telescope like the Lick, and in them look likea

THIN LINE OF LIGHT.

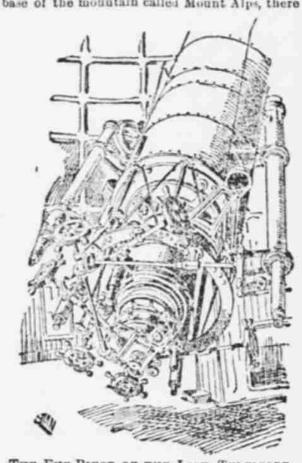
The moons of Saturn are nearly in the plane of the ring, and when it has this appearance they are seen moving on its edge like golden of Mars have been acquired since 1862, as at beads on a silver thread. The disappearance of the rings shows their very great thinness. Prof. Burnham says that Saturn is something in the condition of Jupiter, having too much vapor and clouds to sustain human and animal life. Once more the great platform was raised 15 feet and the glass adjusted on our own satellite. the moon. It appears like a view from Mount Hamilton, looking north toward Mount Diable. that everything would look bare and desolate,

it would resemble it in a marked degree. The moon is composed mostly of barren rocks, ofty mountain peaks, and deep, gloomy ravines. It shows one great plain, which is supposed to be 500 miles long and 50 miles wide. This plain can be easily seen with small telescopes, devoid of trees, vegetation or water. The moon

Another, called PLATO CRATER, was named before the Christian era by Greek astronomers It is supposed to be 100 miles

across and seven miles deep. Some of these volcanic craters are entirely different from any on the earth's surface, appearing to be mere plains surrounded by irregular circular walls. In the formations on the moon there is a very general tendency to circular shape. The greater number of the craters are depressed below the surface, but some are hollowed out in elevations. Sometimes there are small craters on a plain that is surrounded by the walls of a larger crater.

There are also chains of mountains on the soon. Their hights have been ascertained by means of their shadows. It is found that in proportion to the 8:20 of the moon her mountains are higher than those on the earth. These chains of mountains have been named respectively the Alps, Appenines, and Caucasus. To the left of Plato Crater, and joining the base of the mountain called Mount Alps, there



THE EYE-PIECE OF THE LICK TELESCOPE. is a remarkable valley called the Valley of the Alps. It is as level as if it were a roadway made by engineers, and bounded by mountains 18,000 feet high. It is supposed to be six miles wide and 75 miles long.

In the Appenines there is a crater called Archimedes. These mountains rise nearly 17,000 feet above this crater. Extending from capable of reflecting light,

This may account for a curious feature of over the surface of the moon for hundreds of to rest until the final Judgment Day.

There have been only two material changes really proved. They were discovered and deep crater-pit (Linse) was filled up. In the other, a new depression (Hyginus) was formed in the midst of the great plain. Prof. Keeler,



of the Lick Observatory, told us that the

MORE ADVANCED STAGE

no longer support any form of life. Again the great platform was lowered, and

we looked at the red planet Mars. It is one of by the generous donation of the column to us the nearest planets to our earth. Mars is 5,000 | by Doershback & Decker, contractors; Cramer miles in diameter, and travels around the sun & Weary, architects, gave this design gratis, and completes its year in 687 of our days. It | and the erecting and completing of the same has two small moons, discovered in 1877 by Prof. Hall, and these are called Pholos and Delmos. The former revolves around Mars in a little less than eight hours, and as Mars revolves on its axis in about every 24 hours, it | County for their valuable aid: Hou, Howard must move around Mars three times in the Douglass, Cincinnati, O.; Gen. James A. Longcourse of a Martial day. The other moon is street, Gainsville, Ga.; Gen. W. Mahone, Richabout 30 hours. We could plainly see the green seas and the land, which is of a dull reddish

We could see on Mars promontories and Islands, and great rivers extending far inland. Library building, and for State Militia pur-At the poles there are white circles, which diminish in size when the sun is alternately turned toward them at certain seasons, known by astronomers to be the Winter of Mars. The polar hemispheres are seen to be covered miles in depth with what they believe is snow. As the seasons progress and these mighty snows late other Counties and cities to do likewise. melt, the surface of the land is more or less in- This building is an honor to this city, and I undated and cut up with huge rivers and chan-

Prof. Holden said that he discovered the increase in the number of those mysterious



canals in Mars in 1875, two years before they full growth, as it were, they would break away | were re-discovered by Prof. Schiapparelli, of Milan Observatory, Italy. His opinion was then, and is now, that those new canals, or waterways, were caused by the melting of immense snow fields at the poles and the cutting of new channels through the comparative flat revolution around the sun, it takes the whole surface of Mars, being mostly in parallel lines to the old-established rivers or arms of the sea. rings. At two opposite points in Saturn's orbit | He said that Mars is in an unfinished state, the rings are turned edgewise toward us, not suitable at the present time for the existence of human life; something like this earth was when the great San Joaquin and Sacramento Valleys were arms of the sea, and the most of Utah, Nevada and Arizona were covered

THE TWO MOONS that time Mars was in perihelion with the

planet. Prof. Camille Flammarion, the great French astronomer, in a cable dispatch to l'rof. Holden Oct. 7, 1890, said that under his observation the number of canals on Mars have doubled since 1862, and from the fact that some of them are but through the great Lick it looks like a large at right angles from the others, and almost in valley between two mighty ranges of mountains, straight and systematic lines, he thinks they

Astronomers disagree on many points, but they nearly all agree on this, that the conditions of atmosphere, water, and the seasons are right for the production of human and animal life, and that beyond a doubt Mars and Venus are inhabited, perhaps by a race of people far superior to that on our own earth; a race of people who have wonderful ingenuity, and have telescopes constructed so powerful that our great Lick machine would be nothing but a child's toy in comparison. With that powerful instrument turned upon our little planet they could almost see what we ate for breakfast.

There is no telling what the next century or two may bring forth. Science searches long and quietly for great truths of nature, but its discoveries startle the world. Neither this nor the next generation will see it, but we may yet be in direct communication with the inhabitants of the Red Planet. Jules Verne, with his wonderful speculations, may really foreshadow the plans and movements of our descendants. There is no Observatory in the wide world

where the visitor is so well treated and allowed to roam at his will through the various buildings as he is at the Lick Observatory. Prof. Holden and his able corps of assistants are courteous to all visitors, and their endeavors to diffuse knowledge among the thousands of people who visit them yearly is worthy of commendation. James Lick's dream of a lofty mountain peak crowned by a magnificent temple dedicated to science has been realized. The top of Mount Hamilton, high above fogs and storm clouds, overlooking the beautiful Santa Clara Valley, and located in a State noted for its pure air, sunshine, and magnificent scenery, is the ideal place for such an institution. California in the near future will produce a young crop of Herschels and Galileos, whose astronomical researches and vast discoveries will astonish the whole civilized world.

CIRCLEVILLE'S MONUMENT.

The Grand Army and W.R.C. Honor Bead Heroes. EDITOR NATIONAL TRIBUNE: As I have seen nothing in your valuable paper from this the heart of the Nation, Pickaway County, considering Ohio the center of population of this our glorious Union, I bethought me it is subject to periods of high temperature, both would be well to let you know what and how we, the old soldiers, are doing to perpetuate the memory of those who were in the forefront of they may be called warm waves, while in the the battle from 1861 to 1865. Pickaway County, latter they are known locally as Chinook so far as I know, produced no Generals, even by | winds. Both are dependent upon the condibrevet, and yet she had representatives as | tions of atmospheric pressure prevailing over privates, non-commissioned and commissioned | Oregon, Washington, Idaho, Montana and Britofficers up to Colonel, from the opening of the ish Columbia. The Chinook appears with a war at Fort Sumter, April 12, 1861, to the barometric LOW passing eastward over British final surrender of Kirby Smith's forces in Columbia. A barometric HIGH is then central Texas, May 26, 1865. Some of the men who over the Middle Plateau region (Nevada, Utah went out in the volunteer and Regular Army, and western Colorado). This system of atmoseither in infantry, artillery or cavalry (and | pheric circulation gives rise to southwesterly we have also representatives of our navy and | winds over the North Pacific States and the gunboat service among us), were represented Northern Plateau region. This air is both dry in most if not all the battles of the great re- and warm, because it comes from the desert this crater are chasms or canals over 100 miles | bellion, and in all the prison hells from Libby | regions of southeastern Oregon, Nevada and long, supposed to be filled with melted lava, to Tyler, Tex. Did or could any County in western Utah. It has absorbed the heat of which, when cool, presents a smooth surface, this Union do more than this? She has allent those regions where the percentage of atmossleepers in all the National Cemeteries, and | pheric moisture is the lowest in the United some fill the unknown and unmarked graves on | States. Transported over regions covered with the moon's surface seen when she is at the full, the line of their marches and outpost battle- snow the air laps up every vestige of it with and when the perpendicular rays of the sun fronts. Nearly if not all the States repressing rapidity. The humidity increases, shine on her. Streaks of light are seen radi- sented in the war proper, on both sides, hold the air becomes softer and more comfortable, atiating from some of the craters, which run the remains of some soldier from this County, the sun shines with greater warmth, and a

miles, crossing mountains and valleys without The members of Groce Post and Groce date. Such a condition lasts until the winds W.R.C., by donations from home and change to the northwest, north and northeast, They have maps of the moon at the Lick abroad and the patronage of the citizens the barometric Low has passed eastward to the Observatory made so perfect that any changes of Circleville at the fair held in this city in | Mississippi Valley and a HIGH now covers the on her surface, however slight, will be detected February, 1889, accumulated sufficient means North Pacific States, accompanied with cold, and a record made in the interest of science. to erect a monument in Forest Cemetery, near dry air and clouds of snow. Winter again this city, to the memory of our dead comrades, resumes her sway. The hot waves of Summer which is second to none, and we believe will appear with a barometric HIGH over British proved by Dr. Julius Schmidt, Director of the stand for centuries. The foundation is six feet Columbia and Montana, and a barometric Observatory at Athens, Greece. In the first, a deep, 15 feet square at the bottom, tapering to Low over the ocean near Vancouver Island. 13 feet square at the top of the ground; made | Under this condition of atmospheric pressure of large stone and grouted together by cement | the circulation gives rise to northeasterly mortar. The base and die of the monument | winds over Oregon and Washington, carryare square, nicely carved, and cover the founds- | ing over these States the intensely-heated tion completely. The south face contains the air from the lava beds and desert plains inscription: "Erected to the memory of our of Idaho, Montana and British Columbia. dead comrades, 1861 to 1865." The north face | During the Summer this region becomes abbas this inscription: "Erected by Groce Post | normally heated under the quiet and heavy air and Groce W.R.C., 1889." The east face has of a barometric HIGH. The earth where decarved upon it the W.R.C. badge, and the void of vegetation absorbs the heat quickly, and west face has carved upon it the G.A.R. the air resting upon it is kept at a high tembadge. Surmousting this is a Doric col- perature. When this air is transported over a umu with a large scroll coping, and over tois region having rank vegetation like northern a base coping for the statue, to which Oregon and Washington, and of course very the base of the statue is securely bolted. | moist, the effect is to hasten evaporation, raise The statue is of bronze, representing a private | the temperatures exceedingly, develop clouds soldier at parade rest. The statue is nine and give rise to oppressive, sultry weather. feet high and weighs over 700 pounds. These hot waves usually last two or three days, The column has inscribed upon it Antietam, and may continue for a week. There is very little Atlanta, Gettysburg, and Vicksburg, with some | change at night, owing to the large amount of of the principal corps badges between the moisture in the air, and therefore during these above battles and on the buttresses at the base. | torrid spells there is much discomfort to man Altogether it is a beautiful and durable and beast, and some injury to plant growth monument, and from the base to the top of the | where the warm waves are long continued or statue it measures nearly 50 feet. It is sym- | quickly succeed each other. metrical and well proportioned. In style and | An important lesson to learn from this disproportion it resembles the monument erected | cussion is the fact that the temperature changes by Napoteon in Paris out of the melted cannon | ever any region, and at any season of the year moon represents a body like the earth, but in a that he captured. How unlike in that respect is depends upon the topography of surrounding ours, erected to commemorate the deeds of the regions and upon the changes of atmospheric of cooling than the planet on which we live, | private and other soldiers who died to preserve | pressure over them. and that it has reached the stage when it can a Union or free, equal and independent States. a "Government of the people, by the people, for the people." We were enabled to do this for the nominal sum in our treasury. We also acknowledge our obligations to the firm of Bakewell & Mullins for the low price of the statue, and the following non-residents of this

farther away, and revolves around Mars in | mond, Va.; Gen. Kelton, Washington, D. C.; Gen. A. D. Bushnell, Springfield, O. Since the erection and dedication of our monu-\$25,000 for the erection of a Memorial Hall and poses. This fund, with the \$10,000 monumental fund, will be used in buying the ground and completing said building by Nov. 1, 1891. Of this I will write you more in detail after it is dedicated and occupied by Groce Post and Groce W.R.C. I write this that it may stimuwill, with you, Mr. Editor, say all honor to Groce Post and Groce W.R.C., the citizens of Circleville, O., and the old soldiers, dead and living, of Pickaway County, O .- MADISON

HAMMEL, M. D., Circleville, O. A Railroad Conductor with Artificial Legs. It certainly seems as though no amount of numan mutilation can baffle the genius of our American artificial limb makers. No matter how a man is physically wrecked, injured, or lismembered, our human repair shops can put him in shape to make his life worth the living. An instance of this is given in the case of a Mr. Wade who some years ago became the victim of a railroad collision and lost both of his legs. The firm of A. A. Marks, 701 Broadway, New | Cunningham, Arcola, Ill. -Of company of Harry York city, took the young man in charge and | Sams, who died at Fortress Mouroe, Va.; by John soon put him on pins that were as good as those | W. Hall, Harper's Ferry, Va.



earth, and was in a very fine situation to be he had lost so far as their ability to enable him observed; no moons were seen until discovered | to walk and earn a livelihood was concerned. in 1877, 15 years later, by Prof. Hall. The Mr. Wade is now a conductor on a western exgreatest astronomer that ever lived, Sir William | press. He fills his position with extraordinary Herschel, viewed Marsthrough powerful glasses | ability. He passes through his train when going and never discovered them. The theory is at the rate of 50 miles an hour; he collects and that their recent appearance is due to the punches tickets with the suavity of one proud changes of orbit of two asteroids that formerly of his position. The car jolts, hitches, sways, If all the chaparral and trees were cut off from | revolved around the sun in irregular orbits, | and he retains his balance without the least those mountains and deep gloomy ravines, so | and at a certain time came in such close prox- | awkwardness. At stations he alights with agilimity to Mars as to be influenced by that ity, watches his passengers and gives signals. boards his train and walks the passageway with the steadiness of one possessing his natural legs. Day after day for years he has performed this round of duty, and not a soul has had occasion to suspect that he operates on a pair of artificial legs with rubber feet, and only those to whom he voluntarily reveals his condition ever know of his dependence on artificial are the work of human beings. He also thinks extremities. His movements are graceful, his who have charge of it, as well as tell Gemini, and he bade us look at Castor and of the things I saw through its powerful lenses. Having planned an expedition to the lenses and Castor one of the second magnitude. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. The largest is the great that all scientific men, without regard to nationality, should join together to perfect plans distribute. We washington, D. C., the address of any scients of the first magnitude. We washington, D. C., the address of any scients of the first magnitude. We washington, D. C., the address of any scients of the first magnitude. We washington, D. C., the address of any scients of the first magnitude. We washington, D. C., the address of any scients of the first magnitude. We washington, D. C., the address of any scients of the first magnitude. We washington, D. C., the address of any scients of the first magnitude. The distribution of the first magnitude. The contract of the first magnitude. The contract of the first magnitude and the first magnitude. The contract of the first magnitude. The contract of the first magnitude and the first magnitude. The contract of the first magnitude and the first magnitude. The contract of the first magnitude and the first magnitude and the first magnitude. The contract magnitude



SERO FOR OUR CATALOGUE Select a Pinno or Organ rou may make your ow term , and we will sent it with a complete outfit for trial and guarantee

The Marchal & Smith Piano Company, ESTAB. 1859 235 EAST 21st STREET, NEW YORK. INCOR. 1877

THE WEATHER.

Mention The National Tribuna

Warm Periods in Oregon and Washington,

BY LIEUT. J. P. FINLEY, U. S. SIGNAL SERVICE. [Correspondence invited, suggestions desired, and information cheerfully furnished. Every effortemployed to make this Bureau of practical use to our readers. All communications should be addressed—Weather, THE NATIONAL TRIBUNE Office, Washington, D. C.1

Generally speaking the atmosphere is heated in three ways. 1. By the direct rays of the sun. 2. By contact with the warmer earth, 3. By the radiation and reflection of heat from the earth.

The atmosphere over the North Pacific States in Summer and Winter. In the former season sort of Indian Summer prevails on hill and in

THE QUESTION SQUAD. Veterans Anxious to Find Their Comrades-Who Can Ald Them!

[Inquiries for addresses will be inserted as soon as po-sible after receipt. In the Reunion column each week will be found the addresses of many Regimental Secretaries, who have resters in their possession for such reference. Information or the addresses of the follow-

ing-named persons are greatly desired for various reasons: lows.-Of Lieut, Arnold, Lem Baldwin, John Berry, Wm. Scott, John Young, and Frank Berry, Co. K. 6th Iowa; by F. Sisk, Puyallup, Wash, INDIANA .- Of Samuel E. Smith, 2d Ind. Cav.; by

Since the erection and dedication of our monu-ment on July 4, 1859, this city has voted a tax of apolis, Ind.—Of Issue Denton, Philip Davis, Nelson Anter, and Harmon Gregory, Co. A, 50th Ind .: also Charles Thoms, Co. K, 50th Ind.; by John R. Phillips, Winona Springs, Ark. KANSAS. -Of Geo. Mullinnire, Co. A, 15th Kan.; by Sarah I. Abnot, Stanley, Kan, -Of Capt. Lair-

nore and Licut. Pierce, or any one remembering the death of James English, 2d or 14th Kan., killed near Adam's Shop, Ozark, Kan.; by W. R. Nevins, Winoma Springs, Kan. MARYLAND. -Of Charles Leonard, Co. M. 1st Md. Cav., who has been missing from his home for the last six months; he has black hair and gray eyes;

by Mrs. N. J. Leonard, 1313 North Twenty-eighth street, Omaha, Neb. MICHIGAN.-Of Co. I, 23d Mich., who know Wm. Paul; by Jeremiah Leonard, Shoreham, Vt. MISCELLANEOUS, -Of men on detail at Quartermuster's Headquarters, First Division, First Corps, during the Winter of 1863 and '64, at Culpeper and Pittsburg; by B. H. Tripp, Clyde, Neb.—Of Stephen Corey, who left Londonderry, Vt., last February or March; by Stephen Cory, Londonderry, Vt,-Of company and State in which John H. Edinger enlisted; by J. S. McDaniel, Cedar Rapids, Iowa.—Of Lleut, Col. Cole, of Syracuse, N. Y.; Capt. Walpole, of Massachusetts, and Lieut. Subblins, of Vermont, who were captured at the battle of the Wilderness; by E. J. Hamilton, Conway, Ark .- Of Mike Cummins, James Karr, John Marks, Peter Ferguson, Peter McKinney, employes Quartermaster's Department, Beaufort Island, S. C., in Summer or Fall of 1864; by John

MISSOURL-Of W. Cole, who enlisted from Birksville, Mo., in 1861; by W. H. Cole, Shelbing, Mo. -Of Capt, Thomas Greenstreet, 11th Mo. Cav., consolidated with the 2d Mo. Cav.: Capt. Vaid and Lieut, Hubbard, Thomas Chiney and Wm. Oliver, Missouri State Militia; by Mrs. Eliza Ann Pluer, mer, 301 South Emporia avenue, Wichita Kan.—Of Gen. R. J. Osterhaus, Lieut, Rob Cameron, and 600 songs, words and music, 30 cts. N. T. HATHA-John Gefe, Co. G. 3d Mo.; by H. W. Brandle, South Chicago, Ill.—Of Capt. Page, Wm. Nuby and Licut. Baker, Co. G, 6th M. S. M. Cav.; by John Burg, Cameron, Mo. -Of company of F. F. Napeyear, who enlisted from Missouri; by J. H. Barnett, Ingram, Ark. NAVY .- Of gunboat Fort Henry, and who knew

NEW HAMPSHIRE.-Of Co. D. 10th N. H., who knew writer having measles in the Spring of 1864, at Oak Church, Va.; by Joseph H. White, 208 Elm street, New Britain, Conn. New Mexico.-Of Co. G, 1st N. M.; by William Kaniback, North Third street, Kansas City, Kan. NEW YORK .- Of Capt. John Paine, Co. K. 50th N. Y. Eng., and who is supposed to be now living in Washington; by James F. Spaniding, Cortland, N. Y.—Of Peter Hug, 115th N. Y.; also of Ignatz Feierabend, Co. F. 48th N. Y.; by Auston Hug, Elkader, Iowa.—Of 102d N. Y., who remembers Bartley Blue (colored); by B. H. Maxwell, 483 S. Fifth street, Steubenville, O. — Of Capt. Steele,

Lieut, Johnson, Geo. Dennis, and Lieut, Warner, Co. D. 158th N. Y.; by Charles Redway, Muiball, Oklahoma Ter. -Of 72d and 120th N. Y.; by Allen H. Johnson, Leavenworth, Kan. Onio.-Of Joseph Carroll, Co. D. 25th Ohio; by Mrs. A. M. Schofield, Venice, O .- Of Gustavus Burroughs, Co. I, 2d Ohio H. A.; by Mrs. S. N. Burroughs, North Madison, O.—Of information con-cerning the death and burial of Charles DeLong, Co. K. 67th Ohio, who was killed at Fort Gregg, April 2, 1865; by Ira Miller, Valparaiso, Ind. PENNSYLVANIA .- Of Battery F. Pa. L. A., who remembers James Vanzent being injured while firing a minfe at the time of Hooker's taking com-

REGULARS.-Of 1st U.S. Art., Battery A; by John Cunningham, 196 State street, North Adams, Mass. —Of Co. D, 3d Dragoons; by D. D. Pearson, Anita, Iowa .- Of J. L. Bryant, Co. E, 13th U. S.; by S.

mand of the army; by Wm. S. Settle, Lewiston,

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WANTED-By John C. Ryan, No. 117 W. Front St. Muscatine, Iowa, the addresses of Capt. Reed, serg'ts Simpson and John E. Kelloy, Jack Willson, Emery Wourdley, Henry Smith, or J. B. Hackett, of Co. C. 14th Mec.

WANTED-By John Edmonson, Victor Mills, N. Y., the address of any comrade who was on the train going from Chattanooga to Nushville, Tenn., on the morning of April 10, 1865, who remembers of my being shot on right shoulder, near Huntsville, Ala.

WANTED-By A. J. Toolen, Room 50, No. 175 Dear-born street, Chicago, Ill., the address of any soldies who knew Lewis B. Wisby, of Co. A, 1st Iowa Cav. 530-22 WANTED-By John Decker, Hamilton, O., the address of any comrade who knows in what company Daniel P. Armstrong served. He calisted February, 1985, at Benton Barcucks, or St. Louis, in Mississippi Bris

gade, Col A. W. Eller commanding. WANTED-By Mrs. Lorens Smith, 169 Howard avenue, Bridgeport, Conn., the names and addresses of any officers or men who served on the U. S. S. Gess.